



## Little Things Mean a Lot

Good things don't always come in small packages, especially when it comes to particulate air pollution and what it can do to your health. A product of both natural sources and human activities, very small particulate matter has some of the most serious health effects of any air pollutant. In response to concerns about these health effects, the federal Environmental Protection Agency (EPA) is working to develop a new, more protective air quality standard for fine particulate matter.

Particulate matter comes from many sources: soil erosion, diesel engines, road dust from cars and trucks, industry, wood stoves, slash fires, land clearing fires, agricultural burning, and backyard burning. Fine particulate matter has been a health concern for many years. Made up of tiny pieces of soot, dust, and unburned fuel, these particles are too small to be filtered out by your nose and upper respiratory system. They lodge deep in the lungs where they can cause structural damage and chemical changes, and act as carriers for other toxic or cancer-causing materials. Emphysema, asthma, chronic bronchitis, cancer, heart disease, and even death have been associated with exposure to fine particulate matter.



EPA sets air quality standards (or limits) for air pollutants. The standards are based on levels of pollutants in the air that health research has shown are safe to breathe. When air monitors show that a standard has been exceeded in any area of the state, EPA can designate that area a "nonattainment area." The state must take additional actions to reduce the air pollution in nonattainment areas. EPA's current standard for particulate matter is for  $PM_{10}$ , or particulate matter that is 10 microns in size or smaller. (Thousands of particles this size would fit on the period at the end of

this sentence.) The  $PM_{10}$  standard is set at 150 micrograms of  $PM_{10}$  per cubic meter of air, averaged over 24 hours. EPA last updated the  $PM_{10}$  standard in 1986. Since then, health researchers have found that death rates and respiratory illnesses increase when levels of fine particulate matter in the air increase – even if the levels do not exceed the federal standard. This has led to concerns about how well the standard protects health. On November 29, 1996, EPA proposed a new standard for fine particulate matter. The new standard would address particles smaller than  $PM_{10}$ . It would limit

fine particles less than 2.5 microns in size (PM<sub>2.5</sub>) to 50 micrograms per cubic meter of air, averaged over 24 hours – but only after averaging the highest measured concentrations over a three-year period. The current standard for PM<sub>10</sub> would also remain in place, with some changes.

## What would this new standard mean in Washington?

Since the smallest particles pose the biggest health threat, the Department of Ecology believes the new standard would protect health better than the current PM<sub>10</sub> standard. Ecology and local air pollution control agencies have been controlling PM<sub>10</sub> through a permit program for industrial facilities, limitations on wood stove use, restrictions on backyard and land clearing fires, reductions in slash burning and agricultural burning, and actions that reduce road dust and soil erosion. Air quality agencies may need to change the ways they control particulate matter in some areas of the state in order to control the smaller PM<sub>2.5</sub> particles. While dust and soil erosion are a major cause of PM<sub>10</sub>, PM<sub>2.5</sub> is caused mainly by combustion (diesel-powered vehicles, industry, outdoor burning, and wood stoves). In some areas where controlling dust and soil erosion has been a major focus, wood stoves, outdoor burning, cars and trucks, and industry could become more important.

It is still unclear whether areas of Washington that are now designated nonattainment for PM<sub>10</sub> would also be nonattainment for PM<sub>2.5</sub>. Very little monitoring for PM<sub>2.5</sub> has been done so far. Ecology has requested that EPA support Washington and other states with funds to start monitoring PM<sub>2.5</sub>. Based on very limited data, it appears that a few of Washington's current PM<sub>10</sub> nonattainment areas

may remain nonattainment under the proposed new fine particulate standard. Ecology expects that most of the state, including most of our current PM<sub>10</sub> nonattainment areas, would not violate the new standards.

While Ecology supports the change in focus from PM<sub>10</sub> to PM<sub>2.5</sub>, some concerns remain about the structure of the proposed standard. Allowing the highest concentrations of PM<sub>2.5</sub> to be averaged over a three-year period does not seem consistent with addressing short-term, 24-hour health impacts. Monitoring for air pollutants would also be done differently, focusing on the largest population areas rather than on areas where air pollution levels are the highest. In addition, keeping the current PM<sub>10</sub> standard in place as well as adding a standard for PM<sub>2.5</sub> means that states will be required to submit plans on how they will control both types of particulate matter. This could double the current amount of staff time spent on planning and paperwork. Ecology will continue to work with EPA on these issues. EPA will review all comments on the new standard and issue a final policy in July 1997.

## Washington prepares its first “natural events” plan

Ecology, along with local organizations and other local, state, and federal agencies, is preparing Washington's first plan for dealing with air pollution caused by natural events. The plan, the first in the nation to address wildfires, is required by a new EPA policy. It specifies ways to deal with air pollution resulting from wildfires in the central Washington area without having the area designated nonattainment.

We usually associate air pollution with human activities – cars,

industry, and wood burning are three of the largest air pollution sources. But natural events such as volcanic eruptions, earthquakes, wildfires, and dust storms can affect air quality, too. These natural events produce particulate matter, which is regulated



through EPA's standard for PM<sub>10</sub>, or particulate matter smaller than 10 microns in size ([see the article beginning on Page 1 for more details](#)). In 1991, the Department of Ecology was joined by nearly all western states in requesting a new EPA policy to deal with air pollution caused by natural events. EPA adopted the policy in June 1996. By recognizing that natural events are uncontrollable, the new policy allows states more flexibility in dealing with the resulting air pollution, while also increasing public health protection. In 1994, forest fires in Chelan County caused levels of PM<sub>10</sub> in the air that violated the federal health standard. Ordinarily, this could mean EPA would designate the area nonattainment. State and local governments would then adopt a plan to reduce the PM<sub>10</sub> levels in the area, which would require controls on more typical sources of PM<sub>10</sub> such as wood stoves, industry, and cars. However, when the PM<sub>10</sub> is caused by a natural event such as a wildfire, controlling the more typical sources does not significantly reduce the air pollution.



# Lifestyles

We as individuals contribute to the problem of particulate matter air pollution. We burn yard and garden waste; we burn wood stoves and fireplaces, not always using the cleanest of burning methods; and we drive, drive, drive.

- If you live in a part of Washington where open burning is still allowed, first consider alternatives like composting or chipping. Even though burning may seem like an easy way to dispose of all the debris from recent storms, some local landfills are offering chippers for neighborhood use, which can provide you with great mulching and composting material. Contact your city or county solid waste/recycling coordinator for information on chipping.
- If you do burn out of doors, be sure to check with your local fire district for permit requirements. Natural vegetation is the only material it is legal to burn. And remember, according to air quality regulations, your smoke cannot be a nuisance to neighbors or be damaging to the health, safety, or welfare of any person.
- Take a look at your driving habits. Do you drive alone most of the time? Do you make short, frequent trips in your car? With spring here (or at least, on its way!), walking or biking to nearby destinations can give you a chance to get some fresh air and exercise while doing your errands. Even on drizzly days, you can help prevent air pollution by combining the trips you make in your car or taking a neighbor with you.
- Ask your boss about flex time or working at home for a day or two each week. Also, some employers are willing to pay subsidies for transit use or arrange for lower parking fees for carpool or vanpool users. Any of these activities could help reduce the number of trips you make in your car.

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EPA's natural events policy addresses this problem. The policy provides for better public health protection without requiring an area to be designated as nonattainment. In order to qualify for this exemption, state and local agencies must prepare a Natural Events Action Plan to help reduce effects on public health. Washington's wildfire plan for Chelan County includes public education, a public health advisory program, and a determination of the best smoke control measures for Chelan County. Since many efforts had already begun in response to the 1994 wildfires, most of the elements of this plan are already in place in the

Wenatchee area. The plan documents these efforts and focuses on enhancing coordination between local agencies and organizations, landowners, and local staff of state and federal agencies for effective wildfire response. For more information about the plan, contact [Fred Greef](#) at Ecology's Air Quality Program, (360) 407-6099.

## Dust in the wind

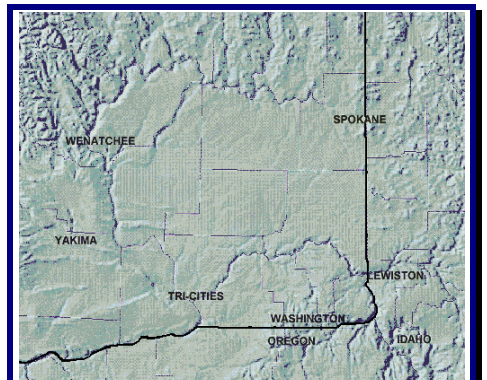
### Washington's special particulate matter problems

Those of us who have lived in Washington State for a while know it's a special place. It has a little bit of everything: mountains, coastline,

prairies, rivers, cities, farmland -- and some of the most spectacular dust storms that occur anywhere in the country. These dust storms occur periodically in eastern Washington's Columbia Basin region when high winds combine with dry weather conditions.

Dust storms have occurred in eastern Washington for many years; Lewis and Clark noted them during their expedition in the early 1800s. The winds during these storms can blow dust clouds more than 100 miles from the source of the dust, and can lead to short-term air pollution levels that are more than ten times higher than the current 24-hour PM<sub>10</sub> standard. Much of the dust ends up in the Spokane and Tri Cities areas. Since Spokane is located in a natural "bowl," its residents are already exposed to trapped wood smoke in the winter, grass field smoke in the early autumn, and motor vehicle emissions throughout the year. These problems combined with windblown dust help make Spokane one of the dustiest cities in the United States, along with Phoenix, Arizona and a number of California cities.

Most dust storms in Washington will probably fall under EPA's natural events policy (see the previous article in this issue). In order for a dust storm to be called a natural event according to this policy, high winds must be blowing over an area that is not affected by human activities (such



**Columbia Plateau**



as farming); and attempts must be made to control the blowing dust. If no attempt is being made to control the dust, the policy does not apply. The state will need to develop a Natural Events Action Plan to address dust storms that are natural events. This plan must include actions to reduce the amount of dust that is stirred up into the air. For example, loose, uncovered soil might need to be removed or reduced at areas such as construction sites or agricultural fields.

To determine the best ways to control windblown dust, more than 40 soil scientists, engineers, microbiologists, and others at Washington State University and across the state are researching the problem. Their research is part of a project called the Columbia Plateau PM<sub>10</sub> Project. A major effort of the project involves understanding how windblown

agricultural dust is generated and how to predict the severity and frequency of dust storms. Researchers have parked a portable “wind tunnel” at different sites to see how different types of soil respond when exposed to various wind conditions and dust control methods. Computer models are being developed to track wind patterns and their effects on PM<sub>10</sub>. And soil microbiologists have developed a way to “fingerprint” soils to figure out where they came from. Using these kinds of methods, researchers hope to figure out where the worst of the windblown dust is coming from and recommend management practices for farmers to control it. Practices could include using cover crops, using different ways of tilling, and leaving more crop residue on top of the soil. For more information, contact [Barb Stuart](#) at Ecology’s Air Quality Program, telephone (360) 407-6869.

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